

containing the notch 86. A drawing amendment is not required in view of the amendment to page 7 of the specification. An amended and clean copy of the amended paragraph is enclosed.

Applicant is the inventor and owner of U.S. Patent No. 6,199,617. This patent has claims defining Applicant's apparatus for opening and closing a bi-fold door and a bi-fold door and lift apparatus for opening and closing the bi-fold door. A terminal disclaimer has been made of record to avoid double patenting.

Applicant has invented a new and novel method and apparatus for moving a bi-fold door between open and closed positions. The apparatus has door lift devices having elongated flat flexible webs having a first end connected to a shaft and a second end connected to an anchor. A reversible electric motor operating at a constant speed selectively rotates the shaft in opposite directions to wind and unwind the webs of all the lift devices on and off the shaft. The webs are wound in overlapping relation so that when the door is opened the rate of speed of the opening of the door increases as the diameter of the overlapping web increases. When the door is moving to the closed position the rate of speed of the closing door decreases as the diameter of the overlapped web decreases. The webs are normally aligned with rotatable members. This alignment is maintained to ensure the overlapping relation of the webs around the rotating members during winding and unwinding of the webs around the rotatable members. The webs do not drift or move laterally during the winding and unwinding processes.

Figures 3 to 5 and 9 to 11 show the elongated flexible web 35 attached to a rod 83 located adjacent cylindrical member 77 so that on rotation of the cylindrical member 77 the web winds and unwinds in overlapping relation around cylindrical member 77. The overlapping relationship of the web around cylindrical member 77 is maintained by web guide plates 79 and 81 located adjacent opposite ends of the cylindrical member 77 and a closed end slot 88 in a shield 87. As seen in Figure 10, the lateral space between plates 79 and 81 is contiguous with the opposite

edges of the web 35. The plates 79 and 81 confine the web to overlapping relationship during winding and unwinding from cylindrical member 77. The closed end slot 88 in shield 87 aligns web 35 with cylindrical member 77. The overlapping relationship of the web during winding and unwinding processes predicate the moving of the door at an increasing rate of speed from the closed position to the open position and moving the door at a decreasing rate of speed from the open position to the closed position. This overlapping relationship of the web on the cylindrical member is always maintained by the guiding function of the plates 79 and 81 and the closed end slot 88 in shield 87.

In use, the webs are strong, require less maintenance than prior wire cables, last longer than wire cables and substantially reduce noise when the bi-fold door is opened and closed. Applicant's webs have at least a 5 to 1 safety factor. Prior bi-fold doors do not use door lift devices having flexible webs and do not open the door at an increasing rate of speed and close the door at a decreasing rate of speed. Applicant's method of opening and closing a bi-fold door moves the panels of the door at an increasing rate of speed from a closed position to an open position and moves the panels at a decreasing rate of speed from an open position to a closed position. There is a long felt need to improve the bi-fold door opening and closing devices and overcome the disadvantages of the winches having wire cables.

Enclosed are the Second Declaration of Michael L. Schweiss and Schweiss brochure, Exhibit C, concerning the commercial importance and success of the claimed method and apparatus for opening and closing a bi-fold door. Schweiss Distributing, Inc. has in the last four (4) years sold 1869 bi-fold doors with sales of \$11,687,421 having the apparatus and method claimed in this patent application. These sales reflect the long felt need for Applicant's web door lifts. These substantial sales of bi-fold doors are material evidence of the commercial success of the claimed apparatus and method. It is the novel door lift devices with flexible webs as defined

in the claims of this application that is the nexus of the commercial success of Applicant's bi-fold doors. The lift devices operated to open and close the bi-fold doors at increasing and decreasing speed rates. This reduces air flow out of a building resulting in a decrease of heat energy loss as explained in paragraph 4 of Mr. Schweiss' Second Declaration. Exhibit C lists the advantages of the lift devices with webs. Mr. Schweiss directly connects the long felt need and success of his bi-fold doors to the lift devices disclosed and claimed in Application No. 09/783,960.

Under 35 U.S.C. 103 commercial success of an invention must be considered in resolving the obviousness of the claimed apparatus and method of opening and closing a bi-fold door.

The relevant portion of 35 U.S.C. 103 provides:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A judgment of obviousness requires that a determination as whether the claimed invention would have been obvious based on underlying factual inquiries, including: 1) the scope and content of the prior art, 2) the level of skill in the ordinary art, 3) the differences between the claimed invention and the prior art, and 4) secondary considerations of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 U.S.P.Q. 459, 467 (1966); *Monarch Knitting Machine Corp. v. Sulzer Morat GMBH*, 139 F.3d 877, 881, 45 U.S.P.Q.2d 1977, 1981 (Fed. Cir. 1998).

Secondary considerations, such as long-felt need, commercial success, and initial expressions of disbelief by experts should be considered in every case for whatever probative value they have and are not limited to cases where patentability is a "close" question. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 U.S.P.Q. 871 (Fed. Cir. 1983).

As the Federal Circuit Court has explained:

[O]bjective evidence such as commercial success, failure of others, long-felt need and unexpected results must be considered before a conclusion on obviousness is reached. * * * Indeed, as then Chief Judge Markey said in *Stratoflex, Inc. v. Aeroquip Corp.* . . . "evidence of secondary considerations may often be the most probative and cogent evidence in the record. It may often establish that an invention appearing to have been obvious in light of the prior art is not." In spite of the importance that the secondary considerations of commercial success, long felt need, and failure of others played in the considerations of both the PTO and trial court, the infringer conspicuously fails to address them.

Minnesota Mining & Manufacturing, Co. v. Johnson & Johnson Orthopaedics, Inc., 976 F.2d 1559, 24 U.S.P.Q.2d 1321 (Fed. Cir. 1992).

Applicant requests that the First Declaration of Michael L. Schweiss and Exhibits A and B and the enclosed Second Declaration of Michael L. Schweiss and Exhibit C be considered in the reexamination of this application.

Claim 1 has been amended to more particularly define the method steps of maintaining the alignment of the flexible webs relative to the rotatable members during winding and unwinding of the webs. The webs are maintained in alignment with the rotatable members during rotation of the rotatable members in one direction to wind the webs in overlapping rotation around the rotatable members to ensure the overlapping of the webs. The result is that the opening speed of the bi-fold door increases as the door opens. The webs are also maintained in alignment with the rotatable members during unwinding of the web from the rotatable members. The result is that the closing speed of the bi-fold door decreases as the door closes. The bi-fold moves at an increasing rate of speed from the closed position to the open position in response to rotation of a rotatable member which is rotated at a constant rate of speed in one direction. The bi-fold door moves at a decreasing rate of speed from the open position to the closed position during rotation of the rotatable member at a constant rate of speed in a direction opposite the one direction. This is achieved by maintaining overlapping relationship of elongated webs around rotatable members during both winding and unwinding of the webs about

the rotatable members. Guide structures are used to prevent drifting or lateral movements of the webs during the winding and unwinding processes.

Claims 3 to 5 are dependant claims that further define the changing speeds of the door during its opening and closing. These speeds change during the entire opening and closing movements of the door.

Claims 18, 19 and 20 also define Applicant's method of opening and closing a bi-fold door. Claim 18 defines the method of using a reversible electric motor and laterally spaced annular plates combined with a shield with a slot for opening and closing the bi-fold door at an increasing opening speed and a decreasing closing speed. The web is guided with the plates and slot in the shield to insure or maintain the overlapping relationship of the web in both wind and unwind conditions. This predicates the increase of door opening speed and the decrease in door closing speed. Claims 19 and 20 further define the operation of the motor speed and door movement speeds. Allowance of Claims 19 and 20 with Claim 18 is requested.

Claim 13 defines Applicant's bi-fold door and apparatus for moving the bi-fold door between open and closed positions. The apparatus has door lift devices having elongated flat flexible webs having a first end connected to a shaft and a second end connected to an anchor. A power means selectively rotates the shaft in opposite directions to wind and unwind the webs of all the lift devices on and off rotatable members. The webs are wound in overlapping relation so that when the door is opened the rate of speed of the opening of the door increases as the diameter of the overlapping web increases. The webs are normal to the axis of rotation of the rotatable members. Each web is maintained in vertical alignment with its associated rotatable member with annular side plates on the rotatable member and a closed end slot in a shield located about the rotatable member. When the door is moving to the closed position the rate of speed of the closing of the door decreases as the diameter of the overlapping web decreases. The

change in speeds of the opening and closing of the door is achieved with the rotatable members turning a constant rate of speed. In use, the webs are strong, require less maintenance than prior wire cables and substantially reduce noise when the bi-fold door is opened and closed. Prior bi-fold doors do not use door lift devices having flexible webs as defined in Claim 13.

Claims 14, 15 and 17 depend on Claim 13. Claim 14 further defines the web as a flat plastic member. Claim 15 defines the plates secured to the shaft and the connection of the web to the plates to confine the web to its overlapping relation around the shaft during winding and unwinding of the web around the shaft. Claim 17 defines the means to adjust the working lengths of the webs so that all the webs work together to open and close the bi-fold door. These claims more particularly define parent Claim 13.

The references of record are the following U.S. patents:

U.S. Patent No. 5,168,914 Keller

U.S. Patent No. 4,949,772 Ballyns et al

U.S. Patent No. 6,042,158 Horn

U.S. Patent No. 325,986 Spangle

U.S. Patent No. 4,014,478 Bonacina

U.S. Patent No. 2,274,216 Sanders

Keller '914 discloses a conventional prior bi-fold door as described in the Background of the Invention and the prior art for the past 60 years. The *Keller '914* door and lift device, shown in Figure 8, comprising a motor 40, winch 46 and cable 48 wound on winch 46. Winch 46 has a cylindrical drum having a uniform diameter. Cable 48 winds and unwinds along the length of the drum. Guide structures are not used to move the cable 48 along the drum during the winding and unwinding processes. The opening and closing of the door episodes occur at a constant speed determined by the speed of rotation of the winch drum. In other words, the speed of opening of

the door does not increase as the door opens. Also, the speed of closing the door does not decrease as the door closes. The total time for opening and closing the door is more than the total time for opening and closing Applicant's bi-fold door. Applicant's shorter door opening and closing time saves power and heat energy loss from the structure equipped with Applicant's bi-fold door and lift apparatus. The cables require periodic adjustments and maintenance and are subject to wear. Applicant's lift devices with webs and web guides are not the mechanical equivalent to the prior art cables and drums in lift devices for bi-fold doors. Applicant's lift devices are different structures that operate in a different manner and achieve functions that are not disclosed by *Keller '914*.

The winches have wire cables, such as aircraft cable and cylindrical drums which are rotated with electric motors to wind and unwind the cables on and off the drums. The drums have uniform outer cylindrical surfaces which accommodate cables along the length of the drums. The cables during winding on the drums can crisscross around the drums. The bi-fold door opening and closing episodes occur at constant speeds determined by the speed of rotation of the drums. The wire cables require periodic adjustments and maintenance. They are subject to wear which reduces their working life. In use wire cables can have frayed cable strands which must be corrected to reduce cable breakage. Wire cables wound on steel drums produce objectionable noise.

Ballyns et al discloses a winch mechanism 16 that includes a reversible motor 40 for driving a shaft 44. A pair of spools 46 are secured to opposite ends of shaft 44. A second spool 48 is connected to shaft 44 through a clutch mechanism 46. Clutch mechanism 46 is designed to permit spool 48 to slip as required in use to accommodate differences between the rate of winding on spools 46 and play out on spool 48. Spools 46 are connected with first strap members 70 to the lower panel of a roll-up door. A second strap member connects the spool 48 to the upper edge of the uppermost door panel. The one-way clutch mechanism 54 allows spool

46 and shaft 44 to free wheel during closing of the door and spool 48 to free wheel during opening of the door. The same spools and strap members are not used to open and close the door. *Ballyns et al* does not disclose nor suggest the use of a single rotatable member accommodating a flexible strap to both increase the speed of opening a bi-fold door and decrease the speed of closing a bi-fold door.

Horn discloses a roll-up door movable to open and closed positions with a conventional garage door opener. Door 20 is counterbalanced with a coil torsion spring 82 mounted around shaft 84. Spindles 86 secured to shaft 84 accommodate cables 90 which are connected to the bottom panel of door 20. Cables 90 are tension members used by spring 82 to counterbalance the weight of the door. The tension members are disclosed as cables. The specification states that other forms of tension members 90 may alternatively be used including, for example, cords, ropes, belts, chains, and the like. *Column 4, lines 46-50*. The tension members are not used to open and close the roll-up door. There is no teaching or suggestion by *Horn* of using an elongated flexible web wound on a rotatable member to increase the speed of opening a bi-fold door and being unwound from the rotatable member to decrease the speed of closing the bi-fold door.

Claim 15 depends on Claim 13. This claim further defines the means connecting the first end of the web to the rotatable means. Plates are secured to the shaft. A rigid member extends between and is mounted on the plates. The web is connected to the rigid member. This structure is not present in *Spangle*. *Spangle* discloses a belt reel rotatably mounted on a spindle C, shown as a stationary cylindrical member. Reel D is rotatably mounted on the spindle. Reel D has a hub I with outwardly directed arms. Pin or rod E mounted on opposite arms provides a connection for the free end of the belt. Reel D is turned with handle G to wind the belt on the reel. Reel D is not secured to spindle C and does not turn with spindle C. There are no plates

secured to a rotatable shaft disclosed by *Spangle*. Claim 15 defines a web connection to a rotatable shaft that is not suggested by *Spangle*. The allowance of Claim 15 is requested.

Bonacina discloses a winch having a drum 7 accommodating a rope 9. The rope is wound along the length of the drum. Drum 7 is located within a housing 4. The housing has an aperture that permits the rope to be drawn out of the winch. The aperture is in a flanged bushing. The bushing does not insure continuous overlapping of the rope around the drum. There is no suggestion of a flexible flat web guided in overlapping relation on a rotatable member.

Sanders, in 1942, discloses the conventional winch and cable device for opening and closing a bi-fold door. As shown in Figures 1 and 2, cables 17 are connected to eye bolts 24 adjustably attached to brackets 25 on the back of the lower panel of the door. There is no showing of a web and means to adjust the working length of the web to allow the door to move to the full open and closed positions as defined in Claim 17.

It is submitted that one skilled in the art of devices for opening and closing bi-fold doors would not use elongated flexible webs with rotatable members driven at a constant speed with web guides to increase the opening movement of a bi-fold door and to decrease the closing movement of the bi-fold door in view of the teachings of *Keller '914*, *Ballyns et al* or *Horn*. Winches having cables to open and close bi-fold doors have been in use for at least 60 years. During this long period of time no one used webs as defined by the claims in bi-fold door opening and closing devices. The Examiner's position that Applicant's lift devices with flexible webs for opening and closing a bi-fold door is the full mechanical equivalent of a cable lift devices as shown in the prior art is not supported by the structure, operation and results of Applicant's lift devices with webs for opening and closing a bi-fold door. Cable door lift devices do not have the same structure, they do not operate in same manner and do not produce the same results as Applicant's door lift devices with flexible webs. Therefore, cable door lift devices are

not mechanically equivalent to Applicant's door lift devices with flexible webs.

Applicant's claimed method and apparatus satisfied a long felt need to overcome disadvantages of the winches having cables in door opening devices. Applicant's claimed method and apparatus has achieved considerable commercial success in a relatively short period of time. This success is predicated on the novel claimed method and apparatus and functions. (Schweiss Declarations and Exhibits A, B and C). *Ballyns et al* uses webs and drums with a clutch mechanism to increase the speed of both opening and closing movements of the door. *Horn* does not use cables or webs to control opening and closing movements of the door. In view of these facts it is submitted that a person skilled in the art of devices for opening and closing bi-fold doors would find that the teachings of *Keller '914*, *Ballyns et al* and *Horn* are insufficient to make, use and operate Applicant's door lift devices with flexible webs and web guides as defined in Claims 1 to 5, 18 to 20 and 13, 14, 15 and 17. Applicant's method Claims 1 to 5 and 18 to 20 and apparatus Claims 13, 14, 15 and 17 are allowable. Allowance of these claims is requested.

Amended and clean copies of amended Claims 1 and 18 are enclosed.

In view of the above remarks and Declarations of Michael L. Schweiss, Applicant requests the allowance of Claims 1 to 5, 13, 14, 15, 17 and 18 to 20.

Respectfully submitted,

MICHAEL L. SCHWEISS

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on February 25, 2003.

(Date of Deposit)

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